**DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

Bay Area Branch
690 Walnut Ave.St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

# WELDING INSPECTION REPORT

**Resident Engineer:** Pursell, Gary
**Address:** 333 Burma Road
**City:** Oakland, CA 94607

**Report No:** WIR-002844
**Date Inspected:** 08-Jun-2008

**Project Name:** SAS Superstructure
**Prime Contractor:** American Bridge/Fluor Enterprises, a JV
**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

**OSM Arrival Time:** 630
**OSM Departure Time:** 1530
**Location:** Shanghai, China

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **CWI Name:** | Hu Wei Qing and Shazhi | | | **CWI Present:** | ☑ Yes | ☐ No | |
| **Inspected CWI report:** | ☐ Yes | ☑ No | ☐ N/A | **Rod Oven in Use:** | ☑ Yes | ☐ No | ☐ N/A |
| **Electrode to specification:** | ☑ Yes | ☐ No | ☐ N/A | **Weld Procedures Followed:** | ☑ Yes | ☐ No | ☐ N/A |
| **Qualified Welders:** | ☑ Yes | ☐ No | ☐ N/A | **Verified Joint Fit-up:** | ☑ Yes | ☐ No | ☐ N/A |
| **Approved Drawings:** | ☑ Yes | ☐ No | ☐ N/A | **Approved WPS:** | ☑ Yes | ☐ No | ☐ N/A |
| | | | | **Delayed / Cancelled:** | ☐ Yes | ☑ No | ☐ N/A |

**Bridge No:** 34-0006
**Component:** OBG and SAS Tower Fabrication

**Summary of Items Observed:**

On this date, Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the fabrication of Orthotropic Box Girder (OBG) and SAS Tower at Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China.

The QA Inspector has randomly observed the following activities on these Bays mentioned below;

BAY 2: 77 and 114M Tower Mock-ups, Plate Cutting, Rolling
This QA Inspector observed 114M Tower Mock-up is idle whereas 77M tower mock up is moved elsewhere. On rolling machine, this QA observed 60mm thick plate marked P222B that appears to be a skin plate stiffener was seen complete. On horizontal milling machine, 5- 60mm thick plates X 400mm width X 1015mm long marked P235(2pcs), P122(1pc), P399(1) and P405(1pc) that look like smaller stiffener were seen complete. Cutting of 11-45mm thick plates marked P521 and A42-1 were seen in progress.

Bay 3: OBG side/bottom/edge panel:
The QA Inspector randomly observed ZPMC welder operators Sun Ti Yu ID Number 054459 and ID #060447 utilizing the Flux Cored Arc Welding (FCAW) Process in the 2F (Horizontal Fillet) Position with a gantry mounted welding apparatus and ZPMC Weld Procedure Specification (WPS) WPS-B-T-2123-3, to weld 2-Open-Rib stiffener to edge plate EP043-001 at weld joint 005/006 and EP047-001 at weld joint 005/006. The QA Inspector randomly observed ZPMC CWI Huang Wen Peng monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 307 amps, 30.4 volts for welder ID # 054459 and 309 amps, 30.0 volts for welder ID #060447 with travel speed randomly observed at 440 millimeters

(mm) per minute. The weld parameters appeared to comply with contract requirements.

This QA also observed tack welding/fit up of 6-WT rib stiffeners on various side panels SP180-001-006 and SP182-001-002 using electrode TL-508, 4.0mm diameter. Grinding/cleaning of these tack welds were on going so with paint coating removal on panel plates.

Bay 4: Tower Diaphragm
The QA Inspector randomly observed ZPMC welder ID number 053609, utilizing the FCAW Process in the 3G (Vertical Groove) Position with ZPMC WPS WPS-B-T-2233-B-U3-F, to weld groove (bent heavy plate) splice butt joint on Tower Diaphragm flange Sub-Assembly NSD1-SA322A/B weld number 10B. The QA Inspector randomly observed ZPMC CWI Zhao Chen Sun monitoring weld parameters. The weld parameters observed were 218Amps, 27.0Volts and 120 mm/min travel speed, which appeared to comply with contract requirements.

This QA randomly observed heat straightening of side panel SP414(A)-001 weld numbers 001-010 and 012~016 due to welding distortion. Oxy-acetylene was used and less than 650 degree C thermal heat input was implemented following procedure HSR1(B)-1106.

This QA Inspector randomly observed ZPMC NDT Botin Yui perform100% Magnetic Particle Testing on one side cover of the following tower diaphragm splice butt joints;

1. ESD1-SA318A/B 3A
2. WSD1-SA310A/B-3B
3. WSD1-SA238A/B-3B

On separate location, Mr. Botin also performed 10% Magnetic Particle Testing on fillet weld between 6-WT rib stiffener to bottom plate BP059-001-056~067. It was noted that rust and scale have been removed by ZPMC workers on weld areas prior MT testing. Electromagnetic Yoke was used with alternating current (AC) as power source. The detection media used was dry red ferromagnetic particles and applied with powder blower while the magnetizing force is on. While the ZPMC NDT Botin was MT testing the welds, this QA randomly perform VT on fillet welds and cover pass mentioned and appears conforming to the project requirements. This QA also observed ZPMC’s conduct of MT on these welds deemed acceptable.

Bay 7: OBG - Floor Beam Sub Assembly:
This QA Inspector randomly observed ZPMC NDT Botin Yui and Cai Xin Xin perform 25% Magnetic Particle Testing on various fillet welds between flange to web plate and stiffener to web plate of the following floor beam sub-assemblies; FB003-055, FB003-036, FB003-051, FB003-035 and FB003-028. It was noted that rust and scale have been removed by ZPMC workers on weld areas prior MT testing. Electromagnetic Yoke was used with alternating current (AC) as power source. The detection media used was dry red ferromagnetic particles and applied with powder blower while the magnetizing force is on. This QA observed ZPMC’s conduct of MT on these welds deemed acceptable.

The QA Inspector randomly observed ZPMC welder Chen Xi Feng ID #052692, utilizing the Submerged Arc Welding (SAW) Process in the 1G Position (Flat Groove) with ZPMC WPS WPS-B-T-2221-B-L2c-S-1, to weld the fill pass in plate splice butt joint FB033-001-101 floor beam. The QA Inspector randomly observed ZPMC CWI Hu Wei Qing monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 510 amps, 30.0 volts with a travel speed of 425 mm per minute. The weld parameters

appeared to comply with contract requirements. This QA also observed another ZPMC welder Huang Xin Lan ID #044780 using the same process and procedure on floor beam plate splice butt joint welding fill pass on FG024-001-081/101.

QA Inspector J. Lizardo randomly observed ZPMC qualified welders Zhang Qingquan ID #044774 and Liu Kai Ge ID #044830 groove welding fill pass on (flange to web plate) tee joint. Mr. Zhang and Mr. Liu were observed welding in the 2G (horizontal) position utilizing a flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic at floor beam FB009-006-043 and FB009-003-043 respectively. QA Inspector Lizardo observed the ZPMC QC CWI Inspector Huang Wen Pang verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS).

FCAW fillet welding (2F) was also observed on flange to web plate of beam sub-assembly FB015-012-010. ZPMC welder working on this was identified as Zhuo Jibo ID# 055564. ZPMC CWI Hu Wei Qing was noted monitoring the parameters. Tack welding/fit-up was continuing on stiffener to web plate of floor beam FB011-006-003 and FB011-006-009 using electrode TL-508. During tack welding/fit-up of these sub-assemblies, paint coating was removed, close and tight gap noted and preheating was used. This QA randomly observed heat straightening of floor beam sub-assembly FB003-030 due to welding distortion. Oxy-acetylene was used and less than 650 degree C thermal heat input was implemented following procedure HSR1(B)-1076.

Bay 8: Tower Diaphragms
The QA Inspector randomly observed ZPMC welder Xu Pei Pei ID Number 050323, utilizing the SAW Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-3221-B-U3c-S-1, to weld the fill pass on plate butt splices of Tower Diaphragm ESD1-SA316A/B-6A/12A. The QA Inspector randomly observed ZPMC CWI Lvliqing, monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 590 amps, 30.2 volts with a travel speed of 468 mm per minute. Weld parameters appeared to comply with contract requirements.

The QA Inspector randomly observed ZPMC welders Bi Laishu ID # 045280 and Yun Chuanshan ID Number 050316, utilizing the FCAW Process in the 2F (Horizontal Fillet) Position with ZPMC WPS WPS-B-T-2132-3, to weld fillet on flange to web plate of longitudinal diaphragm Sub-Assembly LD016-003-005, LD018-003-001, LD015-004-005 and LD017-003-001. The QA Inspector randomly observed ZPMC CWI Shazhi monitoring weld parameters. The weld parameters appeared to comply with contract requirements.

Tack welding on run off tab marked Temp-MUH 04-17 and Temp-MUH 04-18 using Excalibur E9018, 4.0mm diameter electrode and implementing 1G procedure WPS-B-T-3311-TcP4 and 3G procedure WPS-B-T-3313-Tc-P4 for tower diaphragm ESD1-SA301A/B-11A/12A this QA Inspector observed. The QA Inspector randomly observed ZPMC CWI Shazhi monitoring the weld parameters. The preheat was noted greater than 180 degree C but less than 210 degree C.

**Summary of Conversations:**
No significant conversation ocurred today.
**Comments**

# WELDING INSPECTION REPORT

*( Continued Page 4 of 4 )*

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

| | | |
|---|---|---|
| **Inspected By:** | Lizardo,Joselito | Quality Assurance Inspector |
| **Reviewed By:** | Cochran,Jim | QA Reviewer |